Claims

1. A communication device comprising:

a capacitor and an inductor arranged as a matching circuit, the matching circuit having an impedance;

a ferro-electric material positioned to adjust a value that is a member of the group consisting of a capacitance value of the capacitor and an inductance value of the inductor;

a control line operably connected to the ferro-electric material;

a control source electrically connected to the control line, the control source configured to transmit a control signal on the control line;

wherein the ferro-electric material, responsive to the control signal, adjusts the value to change the impedance of the matching circuit.

2. The communication device of claim 1, wherein ~~a wherein~~ the quality factor of the matching circuit, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater

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than about 80 in a frequency range between 0.25 GHz and 7.0 GHz.

3. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 80 in a frequency range between about 0.8 GHz and 7.0 GHz.

4. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 80 in a frequency range between about 0.25 GHz and 2.5 GHz.

5. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 80 in a frequency range between about 0.8 GHz and 2.5 GHz.

6. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 180 in a frequency range between 0.25 GHz and 7.0 GHz.

7. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between

about -50 degrees Celsius and 100 degrees Celsius, is greater than about 180 in a frequency range between about 0.8 GHz and 2.5 GHz.

8. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 80 for a capacitance in a range between about 0.3 pF and 3.0 pF.

9. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 80 for a capacitance in a range between about 0.5 pF and 1.0 pF.

10. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 180 for a capacitance in a range between about 0.3 pF and 3.0 pF.

11. The communication device of claim 1, wherein the quality factor, when operated in a temperature range between about -50 degrees Celsius and 100 degrees Celsius, is greater than about 180 for a capacitance in a range between about 0.5 pF and 1.0 pF.

12. The communication device of claim 1, wherein:

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~~the control signal comprises a direct current voltage;~~

~~the control source is coupled to a band select signal, the band select signal comprising a signal identifying a band in which the matching circuit is to operate; and~~

~~the control source comprises:~~

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~~a lookup table comprising the direct current voltage value corresponding to the band in which the matching circuit is to operate; and~~

~~a voltage source for generating the direct current voltage responsive to the direct current voltage value.~~

~~13. The communication device of claim 1, wherein the control source comprises a power detector which detects a power level of an RF signal and varies the control signal responsive to the power level of the RF signal.~~

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14. The communication device of claim 1, wherein the control source comprises a lookup table and varies the control signal responsive to a value in the lookup table.

15. The communication device of claim 1, wherein the capacitive element comprises a capacitor and the inductive element comprises an inductor.

16. The communication device of claim 1, wherein:

the capacitive element is coupled between an input and an output; and

the inductive element is coupled between the output and ground.

17. The communication device of claim 1, wherein:

the inductive element is coupled between an input and ground; and

the capacitive element is coupled between the input and an output.

18. The communication device of claim 1, wherein:

the inductive element is coupled between an input and an output and

the capacitive element is coupled between the output and ground.

19. The communication device of claim 1, wherein:

the capacitive element is coupled between an input and ground; and

the inductive element is coupled between the input and an output.

20. The communication device of claim 1, wherein:

the capacitive element comprises a capacitor, the capacitor comprising a gap; and

the ferro-electric material is positioned in or near the gap for adjusting the capacitance value of the capacitor.

21. The communication device of claim 1, further comprising an amplifier coupled to the matching circuit.

22. The communication device of claim 21, wherein the amplifier is a low noise amplifier.

23. The communication device of claim 21, wherein the amplifier is a power amplifier.

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~~24. The communication device of claim 1, further comprising:~~

~~an antenna coupled to a first port of the matching circuit; and~~

~~a duplexer coupled to a second port of the matching circuit.~~

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~~25. The communication device of claim 1, further comprising:~~

~~an antenna coupled to a first port of the matching circuit; and~~

~~a diplexer coupled to a second port of the matching circuit.~~